



Teaching For Quality In The Knowledge Triangle – European Institute Of Innovation And Technology's (Eit) Coming Learning Enhancement And Quality Assurance Model

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Abstract¹

The EIT is a new independent community body set up to address Europe's innovation gap and to become a key driver of EU sustainable growth and competitiveness through the stimulation of world-leading innovation. The objective of EIT educational activities is to educate a new breed of entrepreneurs/innovators through excellent EIT master/doctoral programmes focused on creativity, innovation and entrepreneurship.

Traditional academic systems have a strong value system where teaching often comes second after doing research. Everyone has heard of the heavy burden of teaching, no one of the heavy burden of doing research. This is not a fruitful value system if we consider the role education must play for successful and sustainable innovation. Teaching is an art but it is also an intervention, therefore a "before and after" perspective needs to be applied when planning and performing teaching and learning activities. Thus, teaching should be done according to the same principles and attitudes as research is done: clear goals, appropriate methods, critical reflexion and the use of peer reviewing. This can only be achieved by excellent staff dedicated to innovative teaching and with the interest to study and learn from their own educational experiences and results.

The coming learning enhancement and quality assurance model for EIT master and doctoral programs will focus on learning outcomes specifically for creativity, innovation and entrepreneurship, aligned teaching, relevant assessment forms and the teaching research nexus. All embedded in the knowledge triangle. This will be further discussed in this paper, together with the notions that a) HE teaching and quality assurance needs to be based on knowledge and research on teaching and learning, and b) quality assurance mechanisms should, in addition to controlling quality, be useful and supportive tools also when planning and performing teaching.

1. Introduction EIT - a New Animal in the European Educational Landscape

EIT is a new independent community body set up to address Europe's innovation gap and to become a key driver of EU sustainable growth and competitiveness through the stimulation of world-leading innovation. The initiative is based on the knowledge triangle, fostering the integration between research, education and innovation/business across the EU. The mission of EIT concerns both creating new innovations and business, but equally important via its educational activities, to contribute to a skilled workforce with a new more entrepreneurial mindset. EIT's mission is also to elaborate on the models that enable this impact to materialise – EIT as role model for integrating all parts and all actors of the knowledge triangle.

¹ This article follows closely The EIT Draft Strategic Innovation Agenda – Investing in Innovation Beyond 2014 (in prep) co authored by the same authors.



EIT is a distributed organisation consisting of a Governing Board, Headquarters in Budapest, Hungary, and three Knowledge and Innovation Communities (KICs). These are multi-stakeholder, independent, legal and financial integrated entities, governed by a CEO appointed by a board of main stakeholders from academia and business. The KICs are organised around Co-Location Centres (CLCs), geographical locations where most or the whole innovation chain is in close proximity. The emphasis is on people from diverse backgrounds working together with face-to-face contacts. In January 2010, three KICs were in place: Climate-KIC, EIT-ICTLabs and KICInnoEnergy.

EIT is a new innovation infrastructure but it is not a new infrastructure for education. EIT educational programmes are carried out at the KIC universities by their faculty but with the EIT specific learning outcomes and other quality criteria that will be required for the EIT label.

2. The EIT Learning Enhancement - Quality Assurance model

EIT teaching and learning should always take all three sides of the knowledge triangle into account whether educational programs (master and doctoral at present), or activities connected to Continuous Professional Development (CPD). The methodological basis for the EIT Learning Enhancement - Quality Assurance model (EIT LE-QA model) will be to ensure that students attain the EIT specific learning outcomes. EIT students should not only know, they should also know what to do and how to solve real life problems, all framed in an entrepreneurial mindset.

2.1 Teaching and Learning for the Knowledge Triangle

HE in the European countries has been subject to considerable change within a short period. The Bologna process has led to a radical shift in the approach to the quality of education specifically by introducing the learning outcome paradigm, a key concept in this context. The consequences are two clear shifts of perspective. The first involves those concerned - in a change of focus from the teachers' activities to what students do and should do ("from teacher-driven to student-centred"). The second change is temporal - from planning the course or programme "from beginning to end", to a reversal of the process. Learning outcomes are defined first, followed by decisions of fit-for-purpose assessment methods and finally the teaching and learning activities and materials, that supports learners' efforts to achieve the learning outcomes are chosen. This is often referred to as "constructive alignment", "aligned teaching" or sometimes as "the learning chain" and is one of the corner stones of the coming EIT LE-QA Model.

The knowledge triangle has so far mostly been presented as a theoretical concept and political desideratum over changes needed in Europe. This theoretical model now must be transformed into a model of action, an everyday working model for the people involved. One way is to create an enquiry based process around the three nodes of the triangle. Three questions need to be in the mind of everyone at all levels in the system and in all planning and performing: (1) What are the best ways of linking research to education?; (2) What are the best ways of teaching creativity, innovation and entrepreneurship?; and (3) How can optimal conditions be created for entrepreneurs and innovators to bring back their knowledge and experience back into research? These questions also constitutes the starting points for developing the basis for the EIT QA-LE model.

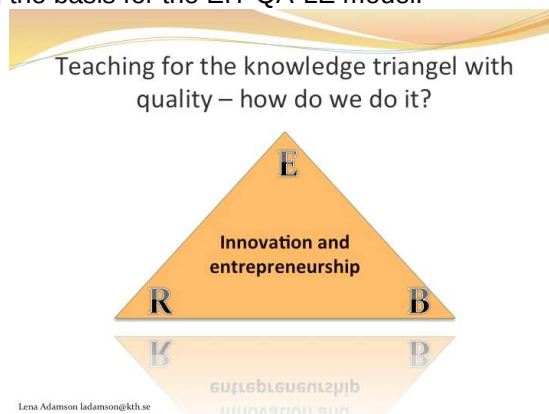




Fig. 1. The knowledge triangle – integrating research, education and business/innovation

2.2 Creating the EIT Learning Enhancement-Quality Assurance model

EIT has a working group consisting of the three educational directors from the KICs, one coordinator from HQ, one representative from DG Education and Culture, and one contracted expert. The group meets regularly to discuss issues related to EIT educational activities. This is to ensure optimal balance between both top down and bottom up working processes and cross KIC development.

The group has so far established EIT specific knowledge forms, and is presently discussing learning outcomes for master and doctoral programs. The model will be ready by early autumn 2011 and the outlines until now are as follows, the model will:

- focus only on EIT specificities avoiding overlaps from national QA systems although in line with a number of relevant recommendations and policy documents [2] [4] [5] [6] [7] [8].
- consist of one part for handling decisions for new programs (KICs' responsibility) and an additional part for reviews of ongoing EIT labelled programs (HQs' responsibility)
- focus on learning enhancement, not just control, providing EIT teachers with tools for their teaching and planning of teaching. This in order to make the QA process less of an administrative burden and more of a general working method guaranteeing good results.
- rest on
- the learning outcome paradigm, concretized as aligned teaching and in terms of coverage, assessability, and fit for purpose assessment methods of learning outcomes
- student centred teaching and learning
- be structured as a set of quality indicators, each with separate assessment areas, for transparency and predictability, see figure 2.
- And where the results from the review process will be presented in reports from the peer review group but also possible to present in quality profiles, see figure 3.

Draft EIT LE-QA model march 31				
	Indicator 1 LOs and assessment	Indicator 2 Learning environment	Indicator 3 Achieved LOs	Indicator 4 Stakeholder opinions
Ass area 1	Research skills/ comp	Faculty	Examwork	Student experience
Ass area 2	Creativity skills/comp	Mobility	Student publications	Alumni experience
Ass area 3	Innovation skills/comp	Gender perspectives	Patents	Other stakeholder exp
Ass area 4	Entrepreneurs hip skills/c	Student participation	ETC - For discussion!	
Ass area 5	Intellectual transf skills/c	Stakeholder participation		
Ass area 6	Judgment and value skills/ grand chall	ETC - For discussion!		

Fig.2. Draft of EIT LE-QA model with examples of four quality indicators each with separate assessment areas. Indicator 1-2 for decisions of approval for new programs, 1-4 for reviews of ongoing programs.

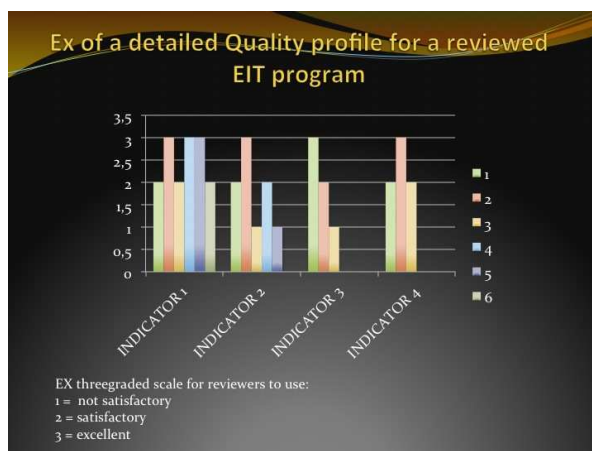


Fig.3. Draft example of a fictive quality profile.

2.3 EIT Knowledge Forms and Learning Outcomes

The EIT learning outcomes are grouped into (six) different forms of knowledge (cf. QF-EHEA), it is however important not to see them as separate components that can be “ticked off” one by one when planning and performing teaching. Instead they should be integrated with each other in a well-balanced manner in order to create educational programs that foster a true entrepreneurial mindset based on the knowledge triangle. On module level relevant/fit-for-purpose assessment tasks then needs to be connected to the learning outcomes, together with teaching and learning activities that support students in the learning process. Aligned teaching gives the student a clear logic and understanding of what s/he will be expected to do and be able to achieve by the end of the study period. By explicitly linking the learning outcomes with relevant assessment forms the teacher also uses one of the strongest learning forces in the system – students’ motivation to succeed with their studies.

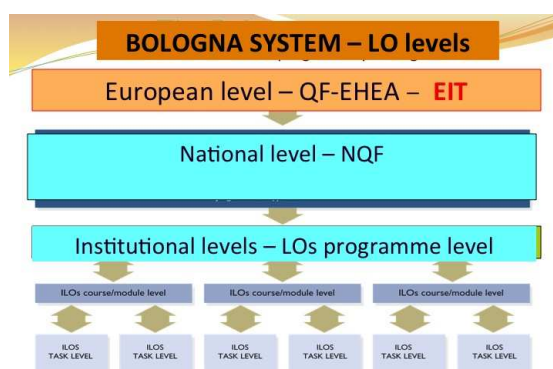


Fig. 4. The different levels, from overarching to specific, for writing learning outcomes in the European system.

The EIT knowledge forms are as follows: Research, Creativity, Innovation and Entrepreneurship skills/competences, Intellectual transforming skills/competences and Judgment and value skills/competencies.

Learning outcomes for master and doctoral level are under development for example, learning outcomes for Innovation skills/competences could look like this: “EIT qualifications that signify completion of the second (master) cycle are awarded to students who are able to demonstrate: The ability to use knowledge, ideas or technologies to create new or significantly improved products, services, processes or policies. And for third (doctoral) cycle: The ability to use their research



combined with the knowledge, ideas or technologies of others to create, test and implement, new or significantly improved products, services, processes or policies.

3. Research on EIT Educational Activities

Teaching is an art but it is also an intervention, therefore we need to keep our “research glasses” on when entering the lecture rooms and meet our students. A problem here should optimally be met with the same curiosity as a problem in the research situation, a drive to investigate what caused it and how it could be solved. Thus, teaching needs to be done according to the same principles and attitudes as research is done: clear goals, appropriate methods, critical reflexion and the use of peer reviewing. EIT’s intention is to develop a systematic approach when it comes to doing research on its own educational activities. The aim for EIT educational programs is to know what results they reach, why they reach these results and how they can improve and develop these results.

However, doing research on educational activities is a complex business due to the large amount of variables interacting with each other in difficult to control manners.

EIT intends to make use of experiences from two research frameworks both dealing with narrowing the gap between laboratory settings and real life contexts; prevention science and designed based research (DBR), the latter often used in the learning sciences. Both frameworks conduct innovative research through partnerships with practitioners that integrate science with practice leading to the development of “usable knowledge” [9], [3]. Prevention science addresses specifically the issue of transferring scientifically proven evidence-based programs into natural community practice systems [1]. DBR on the other hand, starts off directly in the natural setting of educational practice often working with multi-disciplined teams. It attempts to progressively and dynamically generate, improve and learn about a particular phenomenon from interconnected research and design cycles. The focus here is on understanding and improving interventions (i.e., programs, teaching-learning strategies, new materials, curriculum development etc.) via a systematic approach in designing, developing and evaluating these, often in a cyclical manner. The aim is to advance knowledge about the characteristics of these interventions and how to design and develop them further. One important output of designbased research is also the professional development of the participants involved in the research.

EIT will build a knowledge base on these issues that will be made available to other higher education actors.

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